Neural style transfer

You have : C : content image

S : style image

G : Generated image

Cost function :

$$J(G) = \alpha J_{content}(C, G) + \beta J_{style}(S, G)$$

$$J_{content}(C, G) = \frac{1}{2} \| a^{[l](C)} - a^{[l](G)} \|^2$$

$$J_{style}^{[l]}(S, G) = \frac{1}{(2 n_H^{[l]} n_W^{[l]} n_C^{[l]})^2} \sum_k \sum_{k'} (G_{kk'}^{[l](S)} - G_{kk'}^{[l](G)})$$

$$= \sum_{i=1}^{n_H^{[l]} n_W^{[l]}} \sum_{i=1} a_{ijk}^{[l](S)} \; a_{ijk'}^{[l](S)}$$

update G through gradient descent by minimizing cost function above.